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Figure 1 consists of three cross-sectional views of a pump assembly, labeled (a), (b), and (c). Each view shows a different internal configuration of the pump, with various components labeled with numbers and letters.

- View (a):** Shows a pump with a 10-degree V-shaped inlet (10 度V型入口), a 5-degree inlet (5 度入口), a 4-degree inlet (4 度入口), a 6-degree inlet (6 度入口), a 7-degree inlet (7 度入口), a 3-degree inlet (3 度入口), a 2-degree inlet (2 度入口), and a 12-degree inlet (12 度入口). The pump is connected to a 12-degree inlet (12 度入口) and a 12-degree inlet (12 度入口). The pump is connected to a 12-degree inlet (12 度入口) and a 12-degree inlet (12 度入口).
- View (b):** Shows a pump with a 10-degree V-shaped inlet (10 度V型入口), a 5-degree inlet (5 度入口), a 4-degree inlet (4 度入口), a 6-degree inlet (6 度入口), a 7-degree inlet (7 度入口), a 3-degree inlet (3 度入口), a 2-degree inlet (2 度入口), and a 12-degree inlet (12 度入口). The pump is connected to a 12-degree inlet (12 度入口) and a 12-degree inlet (12 度入口). The pump is connected to a 12-degree inlet (12 度入口) and a 12-degree inlet (12 度入口).
- View (c):** Shows a pump with a 10-degree V-shaped inlet (10 度V型入口), a 5-degree inlet (5 度入口), a 4-degree inlet (4 度入口), a 6-degree inlet (6 度入口), a 7-degree inlet (7 度入口), a 3-degree inlet (3 度入口), a 2-degree inlet (2 度入口), and a 12-degree inlet (12 度入口). The pump is connected to a 12-degree inlet (12 度入口) and a 12-degree inlet (12 度入口). The pump is connected to a 12-degree inlet (12 度入口) and a 12-degree inlet (12 度入口).

CONSTITUTION: An ink cartridge 4 is guided until the end of the ink cartridge fitting part thereof reaches the end of a supply pipe support part 2 and the engagement of a part 5 to be guided and a guide part 10 begins to become loose from such a state that the fitting of the ink cartridge fitting part 7 and the supply pipe support part 2 is started and, even after the ink cartridge 4 is mounted, the ink cartridge 4 is not restricted by the guide part 10.

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CLAIMS

[Claim(s)]

[Claim 1] By fitting with ink supply pipe support of the fitting section of an ink cartridge, and an ink cartridge stowage Until it is the cartridge positioning approach at the time of equipping with said ink cartridge and the fitting section and said ink supply pipe supporter of said ink cartridge begin to fit into said ink cartridge stowage The step which guides said ink cartridge and positions the location of the location of an ink supply pipe, and the fitting section of an ink cartridge by engagement to said ink cartridge stowage and said ink cartridge, After fitting of the fitting section of said ink cartridge, and said ink supply pipe supporter The ink cartridge positioning approach characterized by including the step which carries out partial discharge of the engagement to said ink cartridge stowage and said ink cartridge at least, and carries out the completion of wearing of said ink cartridge to said ink cartridge stowage.

[Claim 2] Said positioning step is the ink cartridge positioning approach according to claim 1 of guiding said ink cartridge as there is nothing with backlash about engagement to said ink cartridge stowage and said ink cartridge, and positioning the location of said ink supply pipe, and the location of the fitting section of said ink cartridge with high precision.

[Claim 3] Said completion step of wearing is the ink cartridge positioning approach according to claim 1 which loosens the engagement condition of said ink cartridge stowage and said ink cartridge, guides said ink cartridge, and carries out the completion of wearing of said ink cartridge in said ink cartridge stowage without being restrained by said ink supply pipe supporter.

[Claim 4] Said ink cartridge stowage is the ink cartridge positioning approach according to claim 1 of providing ink in the ink jet recording apparatus which records on a record medium using the ink jet head which carries out the regurgitation.

[Claim 5] Said ink cartridge stowage is the ink cartridge positioning approach according to claim 4 allotted to the carriage which carries out serial migration of the record section.

[Claim 6] Said ink jet head is the ink cartridge positioning approach [equipped with the electric thermal-conversion object for carrying out energy generation for carrying out the regurgitation of the ink] according to claim 4.

[Claim 7] The cartridge stowage for containing the ink cartridge for storing the ink which is the ink jet recording apparatus which records on a record medium using an ink jet head, and is supplied to said ink jet head, The ink in said ink cartridge in order [said] to carry out ink jet head supply The fitting section which said ink cartridge has to said cartridge stowage, and the ink supply pipe located possible [fitting], The supply pipe supporter located in said cartridge stowage in order to support said ink supply pipe, The cartridge installation side for laying the ink cartridge concerned, when said ink cartridge is contained by said cartridge stowage, The interior

material of a proposal prepared in said cartridge stowage in order to engage with said ink cartridge and to show around when showing said ink cartridge to said cartridge installation side, An implication and said interior material of a proposal are an ink jet recording device characterized by having the interior of the 1st proposal and the 2nd proposal which engages with said ink cartridge in the early stages of guidance, and which cancels engagement to said ink cartridge partially at least in the telophase of guidance.

[Claim 8] Said interior of the 1st proposal is an ink jet recording device according to claim 7 which guides said ink cartridge as there is nothing with backlash about engagement to said ink cartridge stowage and said ink cartridge, and positions the location of said ink supply pipe, and the location of the fitting section of said ink cartridge with high precision.

[Claim 9] Said interior of the 2nd proposal is an ink jet recording device according to claim 8 which loosens the engagement condition of said ink cartridge stowage and said ink cartridge, guides said ink cartridge, and equips said ink cartridge stowage with said ink cartridge in the condition of not being restrained by said supply pipe supporter.

[Claim 10] Said interior of the 2nd proposal is an ink jet recording device according to claim 9 which has a taper configuration for loosening the engagement condition to said ink cartridge.

[Claim 11] Said ink cartridge stowage is an ink jet recording device according to claim 8 arranged on the carriage which carries out serial migration of the record section.

[Claim 12] Said ink jet head is an ink jet recording device [equipped with the electric thermal-conversion object for generating the energy for carrying out the regurgitation of the ink] according to claim 8.

[Claim 13] It is contained by the cartridge stowage of the ink jet recording apparatus which records on a record medium using an ink jet head. The supply pipe supporter and cartridge installation side for supporting an ink supply pipe and this ink supply pipe are located in this cartridge stowage here. The fitting section for fitting in with said ink supply pipe, in order to be an ink cartridge for storing the ink supplied to said ink jet head and to supply the ink in said ink cartridge to said ink jet head, The interior material of a proposal for engaging with said cartridge stowage and showing around, in case said ink cartridge is guided to said cartridge installation side is included. Said interior material of a proposal The ink cartridge characterized by having the interior of the 1st proposal and the 2nd proposal which engages with said ink cartridge in the early stages of guidance, and which cancels engagement to said ink cartridge partially at least in the telophase of guidance.

[Claim 14] Said interior of the 1st proposal is an ink cartridge according to claim 13 which guides said ink cartridge as there is nothing with backlash about engagement to said ink cartridge stowage and said ink cartridge, and positions the location of said ink supply pipe, and the location of the fitting section of said ink cartridge with high precision.

[Claim 15] Said interior of the 2nd proposal is an ink cartridge according to claim 13 which loosens the engagement condition of said ink cartridge stowage and said ink cartridge, guides said ink cartridge, and equips said ink cartridge stowage with said ink cartridge in the condition of not being restrained by said supply pipe supporter.

[Claim 16] Said interior of the 2nd proposal is an ink cartridge according to claim 13 which has a taper configuration for loosening the engagement condition to said ink cartridge stowage.

[Claim 17] Said ink cartridge stowage is an ink cartridge according to claim 13 allotted to the carriage which carries out serial migration of the record section.

[Claim 18] Said ink jet head is an ink cartridge [equipped with the electric thermal-conversion object for generating the energy for carrying out the regurgitation of the ink] according to claim 13.

[Claim 19] As opposed to the predetermined stowage material which sealed ink inside with the plug which consists of an elastic member in which the prepared hole was formed The ink cartridge which can be detached and attached freely, The supply pipe arranged on said stowage material in order to supply the ink in this ink cartridge to an ink jet recording head, It is the ink jet recording device equipped with the supply pipe supporter which supports this supply pipe. The guide means for being prepared relatively [ink cartridge / said / predetermined stowage material and said predetermined ink cartridge], and showing said ink cartridge to the interior of said predetermined stowage material, It is prepared near the plug of said ink cartridge, and fitting is carried out to said supply pipe supporter in the process in which the interior of said predetermined stowage material is equipped with said ink cartridge using said guide means. The ink jet recording device characterized by having the ink cartridge fitting section which performs positioning with the location of said supply pipe, and the location of the prepared hole of said plug.

[Claim 20] Said guide means is an ink jet recording device according to claim 19 constituted in the process in which said predetermined stowage material is equipped with said ink cartridge so that that time may make loose the engagement condition of said predetermined stowage material which was not with backlash, and said ink cartridge when the tip of said ink cartridge fitting section reaches at the tip of said supply pipe supporter.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink cartridge and ink jet recording apparatus which are used for the ink cartridge positioning approach at the time of making an ink jet recording apparatus equip with an ink cartridge, and this approach.

[0002]

[Description of the Prior Art] Conventionally, the thing about the structure of positioning a removable ink cartridge to a position in an ink jet recording apparatus is known for JP,63-15752,A or JP,59-12855,A.

[0003] The mimetic diagram showing the positioning structure of the conventional ink cartridge where drawing 6 was indicated by JP,63-15752,A, and drawing 7 are the mimetic diagrams showing the positioning structure of the conventional ink cartridge indicated by JP,59-12855,A.

[0004] The positioning structure of an ink cartridge shown in drawing 6 makes a plug penetrate a needle 66, making the plug of an ink cartridge 61, and the needle 66 of a cartridge case 63 position, and it consists of inserting making the locator pin 62 prepared in the ink cartridge 61 meet the location notch 64 prepared in the cartridge case 63 so that ink may be supplied from the ink feed hopper 65 of a cartridge case 63 through the plug of an ink cartridge 61.

[0005] The positioning structure of an ink cartridge shown in drawing 7 is inserting and carrying out fitting of the ink cartridge 71 to the supply pipe 73 for supplying ink to the ink tank 72, and is the structure of positioning an ink cartridge 71 and preventing the ink leakage from an ink cartridge 71.

[0006]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional example, there are the following troubles in positioning of an ink cartridge.

[0007] The tip of the needle for leading the ink in an ink cartridge in an ink jet head is keenly dangerous with the conventional example shown in JP,63-15752,A. Then, although what is necessary is just to form the prepared hole in the plug beforehand using tubing of the shape of a pipe which is not sharp so that tubing may penetrate the plug of an ink cartridge easily, even if it takes such a cure, if there is a location gap of the prepared hole of a plug and tubing, tubing may penetrate to a plug, and may run away, or may not penetrate at all.

[0008] Moreover, in the conventional example shown in JP,59-12855,A, only the ink supply pipe for supplying ink to an ink tank on the occasion of wearing of an ink cartridge is prepared, but since the part which carries out fitting in the case of wearing of an ink cartridge becomes the so-called hand darkness, it is hard to equip with it. As the cure, the guide section is prepared in the periphery of an ink cartridge etc., and it is possible to guide even the part which finally carries out fitting.

[0009] However, as a result of restraining the fitting section of an ink cartridge even after positioning an ink cartridge and an ink supply pipe by fitting if the above-mentioned guide section is prepared and dimension process tolerance of an ink cartridge is further made high fairly in order to carry out fitting of the ink cartridge certainly to the above-mentioned ink supply pipe when it is made such a configuration, it is not desirable when a load joining the supporter of an ink supply pipe etc. and exchanging ink cartridges frequently is considered. On the other hand, if the clearance between the above-mentioned guide section and an ink cartridge is enlarged and dimension process tolerance is made loose, although the above-mentioned load is not added, it cannot show correctly the part which finally carries out fitting to an ink cartridge, but will stop being able to fit in easily. Furthermore, since the clearance is large when an ink cartridge is leaned by hand etc., an ink cartridge will incline easily, consequently a supply pipe, a supply pipe supporter, etc. will be joined by the load.

[0010] Then, it is in the purpose of this invention offering the ink cartridge positioning approach that show around with a sufficient precision in wearing of an ink cartridge, and positioning in view of the trouble of the above-mentioned conventional technique until fitting of an ink supply pipe and an ink cartridge begins, and a load joins neither a supply pipe nor a supply pipe supporter after fitting termination, this ink cartridge, and an ink jet recording device.

[0011] Other purposes of this invention The predetermined stowage material for containing an ink cartridge up to the location into which the fitting section of an ink cartridge and the supporter of an ink supply pipe begin to fit, and engagement of an ink cartridge so that there may be nothing with backlash While showing around and positioning the location of an ink supply pipe, and the location of an ink cartridge with high precision It is loosening the engagement condition of predetermined stowage material and an ink cartridge after fitting. The ink cartridge positioning approach which can also lessen the burden to a supply pipe supporter, without restraining an ink cartridge with the supporter of an ink supply pipe after predetermined stowage material is completely equipped with an ink cartridge, It is in offering this ink cartridge and an ink jet recording device.

[0012]

[Means for Solving the Problem] The 1st invention for attaining the above-mentioned purpose by fitting with ink supply pipe support of the fitting section of an ink cartridge, and an ink cartridge stowage Until it is the cartridge positioning approach at the time of equipping with said ink

cartridge and the fitting section and said ink supply pipe supporter of said ink cartridge begin to fit into said ink cartridge stowage. The step which guides said ink cartridge and positions the location of the location of an ink supply pipe, and the fitting section of an ink cartridge by engagement to said ink cartridge stowage and said ink cartridge. After fitting of the fitting section of said ink cartridge, and said ink supply pipe supporter. It is characterized by including the step which carries out partial discharge of the engagement to said ink cartridge stowage and said ink cartridge at least, and carries out the completion of wearing of said ink cartridge to said ink cartridge stowage.

[0013] The 2nd invention for attaining the above-mentioned purpose is an ink jet recording device which records on a record medium using an ink jet head. The cartridge stowage for containing the ink cartridge for storing the ink supplied to said ink jet head, and the ink in said ink cartridge in order [said] to carry out ink jet head supply. The fitting section which said ink cartridge has to said cartridge stowage, and the ink supply pipe located possible [fitting], The supply pipe supporter located in said cartridge stowage in order to support said ink supply pipe, The cartridge installation side for laying the ink cartridge concerned, when said ink cartridge is contained by said cartridge stowage, The interior material of a proposal prepared in said cartridge stowage in order to engage with said ink cartridge and to show around when showing said ink cartridge to said cartridge installation side, An implication and said interior material of a proposal are characterized by having the interior of the 1st proposal and the 2nd proposal which engages with said ink cartridge in the early stages of guidance and which cancels engagement to said ink cartridge partially at least in the telophase of guidance.

[0014] The 3rd invention for attaining the above-mentioned purpose is contained by the cartridge stowage of the ink jet recording apparatus which records on a record medium using an ink jet head. The supply pipe supporter and cartridge installation side for supporting an ink supply pipe and this ink supply pipe in this cartridge stowage here are carrying out the location location. The fitting section for fitting in with said ink supply pipe, in order to be an ink cartridge for storing the ink supplied to said ink jet head and to supply the ink in said ink cartridge to said ink jet head, The interior material of a proposal for engaging with said cartridge stowage and showing around, in case said ink cartridge is guided to said cartridge installation side is included. Said interior material of a proposal. It is characterized by having the interior of the 1st proposal and the 2nd proposal which engages with said ink cartridge in the early stages of guidance and which cancels engagement to said ink cartridge partially at least in the telophase of guidance.

[0015] As opposed to the predetermined stowage material to which the 4th invention for attaining the above-mentioned purpose sealed ink inside with the plug which consists of an elastic member in which the prepared hole was formed. The ink cartridge which can be detached and attached freely, The supply pipe arranged on said stowage material in order to supply the ink in this ink cartridge to an ink jet recording head, It is the ink jet recording device equipped with the supply pipe supporter which supports this supply pipe. The guide means for being prepared relatively [ink cartridge / said / predetermined stowage material and said predetermined ink cartridge], and showing said ink cartridge to the interior of said predetermined stowage material, It is prepared near the plug of said ink cartridge, and fitting is carried out to said supply pipe supporter in the process in which the interior of said predetermined stowage material is equipped with said ink cartridge using said guide means. It is characterized by having the ink cartridge fitting section which performs positioning with the location of said supply pipe, and the location of the prepared hole of said plug.

[0016] In the 4th invention of the above, if the interior is equipped with the ink cartridge using

the guide means to predetermined stowage material, fitting of the ink cartridge fitting section prepared near the plug for sealing ink in an ink cartridge will be carried out to the supply pipe supporter which protruded on the ink jet recording head built in predetermined stowage material, and it will perform positioning with the location of a supply pipe, and the location of the prepared hole of a plug.

[0017] In such a wearing process, up to the location into which the ink cartridge fitting section and a supply pipe supporter begin to fit, since it shows a guide means to predetermined stowage material and engagement of an ink cartridge so that there may be nothing with backlash, the location of a supply pipe and the location of the prepared hole of a plug are positioned with high precision. Moreover, since the guide means makes loose the engagement condition of a predetermined member and an ink cartridge from the time of being in a fitting condition, after being completely equipped with an ink cartridge, the load to a supply pipe supporter of an ink cartridge is also lost, without being restrained.

[0018]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0019] (1st operation gestalt) Drawing 1 is a mimetic diagram showing the 1st operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention, and shows the condition at the time of ink cartridge wearing.

[0020] The ink jet recording apparatus with the positioning structure of the ink cartridge of this gestalt is equipped with the carriage 9 for carrying out serial migration of the predetermined ink cartridge stowage material 9a which laid the ink jet recording head 1 as shown in drawing 1 along a record section. In addition, stowage material 9a may be a member equipped with ink cartridge installation side 9b, and although you may be carriage 9 and one, you may be another member which can be freely detached and attached from carriage 9. By this example, stowage material 9a and carriage 9 explain the configuration of one. Carriage 9 is fitted in the surroundings of the sliding shaft 12 pivotable that the end section can slide on the sliding shaft 12, and the other end is engaging with the guide 13. Moreover, carriage 9 can reciprocate in accordance with the sliding shaft 12 with respect to a part of non-illustrated timing belt by driving a timing belt by the non-illustrated motor. During this reciprocating motion, an ink jet recording apparatus makes ink breathe out from the ink jet recording head 1 to predetermined timing, and forms a printing image. In addition, the ink jet recording head 1 is equipped with the electric thermal-conversion object (what transforms electrical energy into heat energy) or electric machine conversion object (mechanical in electrical energy thing changed into a variation rate) for generating the energy for making ink breathe out from an ink delivery.

[0021] Furthermore cartridge stowage material 9a is what has the removable ink cartridge 4 which can store ink, and the supply pipe 3 for leading the ink in an ink cartridge 4 in the ink jet recording head 1 has protruded perpendicularly with the supply pipe supporter 2. Moreover, after the supply pipe 3 and the supply pipe supporter 2 are attached not only in the gestalt currently directly fixed to cartridge stowage material 9a but in other members 1, for example, ink jet recording head, and this supply pipe 3 and the supply pipe supporter 2 carry out positioning wearing of this ink jet recording head 1 at cartridge stowage material 9a, they may be a gestalt which contains an ink cartridge 4 to cartridge stowage material 9a. The supply pipe 3 and the supply pipe supporter 2 at least should just be located possible [an ink cartridge 4 and fitting] to cartridge stowage material 9a.

[0022] The quirk-like guided section 5 is formed in the lateral portion of an ink cartridge 4. The

guide section 10 which has the taper section 11 of a taper configuration in the ink cartridge installation side 9b side is formed in cartridge stowage material 9a. The guided section 5 of an ink cartridge 4 is set up so that insertion may have become possible and there may be only no flute width by the side of the pars basilaris ossis occipitalis of the ink cartridge 4 guided [5] in the guide section 10 as backlash ***** in the engagement condition of the guided section 5 and the guide section 10. Although the guided section 5 is formed in an ink cartridge 4 and the guide section 10 is formed in carriage 9 in this example The guide means which consists of the guide section which can be inserted in quirk-like the guided section and, and this The guide section which can be inserted in the guided section may be prepared for quirk-like the guided section in cartridge stowage material 9a at the ink cartridge 4 that what is necessary is to just be prepared relatively [a / ink car TORRIJI 4 and / cartridge stowage material 9]. Moreover, high positioning of precision of the direction in which two or more engagement parts of the above-mentioned guided section and the guide section are established is attained more.

[0023] Moreover, the plug 6 which has the elasticity which once formed the prepared hole with the needle etc. beforehand is built into an ink cartridge 4, it has that by which the ink inside the ink cartridge 4 concerned is sealed with the plug 6, and the plug 6 which a hole penetrates easily by forcing the tip of a supply pipe 3, and that by which ink was sealed inside the ink cartridge 4 concerned is used. Near the plug 6, after guiding an ink cartridge 4 along with the guide section 10, the ink cartridge fitting section 7 into which the supply pipe supporter 2 fits is formed.

[0024] The omission stop section 8 which it is caught [section] in the opening 14 for a stop prepared in carriage 9, and makes an ink cartridge 4 hold in carriage 9 is formed in the ink cartridge 4. Two or more ink cartridges 4 (yellow, MAZENDA, cyanogen, black) can carry this example in carriage 9.

[0025] Next, the process in which an ink cartridge 4 and a supply pipe 3 are positioned is explained.

[0026] Drawing 2 is drawing for explaining the wearing process and approach of an ink jet cartridge in the 1st operation gestalt of this invention.

[0027] A user inserts the guided section 5 of an ink cartridge 4 in the guide section 10 of cartridge stowage material 9a, and he pushes an ink cartridge 4 on the cartridge installation side 9b side of cartridge stowage material 9a, making the guide section 10 meet.

[0028] Then, as shown in (a) of drawing 2 , a supply pipe 3 will be in the condition of having entered in the space of the ink cartridge fitting section 7. At this time, the plug 6 of an ink cartridge 4 does not reach a supply pipe 3 yet, but the guided section 5 is in the engagement condition which is not the guide section 10 and with backlash.

[0029] When an ink cartridge 4 is further pushed down the drawing (cartridge installation side 9b side) from the condition of (a) of drawing 2 , as shown in (b) of drawing 2 , it is in the condition to which the tip of the ink cartridge fitting section 7 reached at the tip of the supply pipe supporter 2, namely, fitting of the ink cartridge fitting section 7 and the supply pipe supporter 2 will be started. Since the taper section 11 is formed in the pars-basilaris-ossis-occipitalis side of cartridge stowage material 9a of the guide section 10 at this time, the engagement condition of the guided section 5 and the guide section 10 tends to begin to become loose. Moreover, although the plug 6 has not reached a supply pipe 3 in this condition in drawing 2 (b), the plug 6 and the supply pipe 3 may contact.

[0030] If an ink cartridge 4 is furthermore pushed below, as shown in (c) of drawing 2 , the ink cartridge fitting section 7 and the supply pipe supporter 3 are inserted by fitting, and engagement of the guided section 5 and the guide section 10 is loose completely in this condition.

[0031] Then, by laying an ink cartridge 4 in cartridge installation side 9b of carriage 9 completely, a plug 6 reaches a supply pipe 3, a supply pipe 3 penetrates the prepared hole of a plug 6 or a plug 6, and requires for the opening 14 for a stop the omission stop section 8 shown in drawing 1 , and wearing of an ink cartridge 4 ends it.

[0032] As mentioned above, since engagement of the guided section 5 and the guide section 10 begins to become loose, an ink cartridge 4 is not restrained by the guide section 10 from the condition to which the tip of the ink cartridge fitting section 7 of an ink cartridge 4 reached at the tip of the supply pipe supporter 2, i.e., the condition that fitting of the ink cartridge fitting section 7 and the supply pipe supporter 2 is started, after wearing of an ink cartridge 4.

[0033] Therefore, smooth wearing of an ink cartridge 4 is attained, and the load to the supply pipe supporter 2 after equipping with an ink cartridge 4 is lost, the inclination of the bad influence to the internal passage of the supply pipe supporter 2 and the ink jet recording head 1 and the face side of the ink jet recording head 1 can be stopped to the minimum in the configuration with which especially the supply pipe supporter 2 is formed in the direct ink jet recording head, and a clear printing image is obtained.

[0034] Moreover, the ink cartridge 4 and really fabricated omission stop section 8 has spring nature. [before pushing an ink cartridge 4, escaping from it and the stop section's 8 starting the opening 14 for a stop] In order to contact the part near the opening 14 for a stop, the force acts in the direction which forces an ink cartridge 4 on the guide section 10, and there is a possibility of barring fitting insertion with the ink cartridge fitting section 7 and the supply pipe supporter 2, in the moment engagement of the guided section 5 and the guide section 10 becomes loose.

[0035] Therefore, it becomes possible to aim at an improvement of the further exact positioning and operability by setting up the location where it escapes and the spring nature of the stop section 8 begins to act, after the ink cartridge fitting section 7 and the supply pipe supporter 2 changed into the fitting condition.

[0036] (2nd operation gestalt) Drawing 3 is a mimetic diagram showing the 2nd operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[0037] This gestalt is an example of a configuration which supplies the ink in ink car TOJJI 24 to the ink tank 34 of the ink jet recording head 21 which equipped with the ink cartridge 24 the cartridge case 33 which is stowage material, and was carried in carriage 28 through a tube 35, as shown in drawing 3 .

[0038] Carriage 28 is fitted in the surroundings of the sliding shaft 31 pivotable like the 1st operation gestalt that the end section can slide on the sliding shaft 31, and the other end is engaging with the guide 32. Moreover, carriage 9 can reciprocate in accordance with the sliding shaft 31 with respect to a part of non-illustrated timing belt by driving a timing belt by the non-illustrated motor. During this reciprocating motion, an ink jet recording apparatus makes ink breathe out from the ink jet recording head 21 to predetermined timing, and forms a printing image.

[0039] The end of the tube 35 connected to the ink tank 34 and the other end of the opposite side are connected to the supply pipe supporter 22 of the supply pipe 23 formed in the inner part of the cartridge case 33. Moreover, the surroundings of a supply pipe 23 are surrounded with the bigger wall 36 than a supply pipe 3, and it constitutes so that the ink cartridge fitting section 27 and a wall 36 may fit in.

[0040] Moreover, the guide section 29 is formed in drawing ***** at the pair, and the guided section 25 of the shape of a quirk corresponding to each of the guide section 20 is formed in the ink cartridge 24 side at the cartridge case 33.

[0041] In this example, since the supply pipe 23 is covered with the wall 36, the configuration which it has that it is hard to be touched by hand, consequently adhesion or the impossible force of dust etc. does not join is shown.

[0042] Next, with reference to drawing 3, the process and the approach that an ink cartridge 24 and a supply pipe 23 are positioned are explained.

[0043] A user inserts the guided section 25 of an ink cartridge 24 in the guide section 29 of a cartridge case 33, and he pushes an ink cartridge 24 on the back side of a cartridge case 73, making the guide section 29 meet.

[0044] Then, it will be in the condition that the tip of the ink cartridge fitting section 27 reached at the tip of a supply pipe 23 and that are a condition, namely, fitting of the ink cartridge fitting section 7 and a wall 36 is started. Since the taper section 30 is formed in the edge of the guide section 29 by the side of the back of a cartridge case 33 at this time, the engagement condition of the guided section 25 and the guide section 29 tends to begin to become loose. Moreover, in this condition, the plug 26 has not reached a supply pipe 23.

[0045] If an ink cartridge 24 is furthermore pushed on the back, since fitting of the ink cartridge fitting section 27 and the wall 36 is carried out and it will be in the condition that engagement of the guided section 25 and the guide section 29 became loose completely, in this condition, an ink cartridge 24 is not strongly restrained from the guide section 29 in the method part of the back of a cartridge case 33.

[0046] After that, further, by pushing an ink cartridge 24, a plug 26 reaches a supply pipe 23, a supply pipe 23 penetrates the prepared hole of a plug 26 or a plug 26, and wearing of an ink cartridge 4 ends it.

[0047] (3rd operation gestalt) This gestalt is considered as the configuration in which a load does not join the supply pipe in the 2nd operation gestalt further.

[0048] Drawing 4 is the cross-section enlarged drawing of the supply pipe periphery of the 3rd operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention. In this drawing, the same sign is attached about the same configuration member as drawing 3, and that explanation is omitted in explanation of this example about the part which overlaps the 2nd operation gestalt.

[0049] In drawing 4, the projection 18 for giving seal nature is formed in both sides of plug 26a, and the slant face 37 is formed in the prepared hole of plug 26a by the side of the tip of the ink cartridge fitting section 27. since [moreover,] plug 26a gives a gap 39 and is included in the ink cartridge 24 -- the direction of an arrow head -- migration -- it is easy.

[0050] as mentioned above, after plug 26a was included in the ink cartridge 24 -- the direction of an arrow head -- migration, since it is easy In the process in which the ink cartridge fitting section 7 and a wall 36 fit in, and are inserted Plug 26a moves to a supply pipe 23 according to an operation of a slant face 37 and a gap 39, and a supply pipe 23 and the prepared hole of plug 26a are positioned still more correctly, without adding a load, and the fall of operability is not caused.

[0051] (4th operation gestalt) Drawing 5 is drawing showing the ink cartridge fitting section which is the 4th operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[0052] This gestalt gives spring nature as a piece 40 of fitting in drawing 5 by forming notching 41 in the ink cartridge fitting section shown in the 1st or 2nd operation gestalt. By using this configuration, it becomes possible to mitigate the load to a supply pipe supporter and an ink jet recording head further to the 1st and 2nd examples mentioned above.

[0053]

[Effect of the Invention] Since this invention is constituted as explained above, effectiveness which is indicated below is done so.

[0054] (1) In order to connect an ink jet recording head with an ink cartridge through a supply pipe, in case it equips with the ink cartridge to predetermined stowage material, while guiding an ink cartridge using a guide means The ink cartridge fitting section prepared near the plug for sealing ink in an ink cartridge By carrying out fitting to the wall surrounding the surroundings of the supply pipe which protruded on the supply pipe supporter which protruded on predetermined stowage material, or the interior of predetermined stowage material, and considering as the structure of performing positioning with the location of a supply pipe, and the location of the prepared hole of a plug or a plug Operability is raised and the location of a supply pipe and the location of the prepared hole of a plug or a plug can be positioned with high precision.

[0055] (2) When it arrives at the location where fitting of the ink cartridge fitting section and the supply pipe supporter begins to be carried out in the process which equips with an ink cartridge and goes, damage on the supply pipe supporter in wearing of a frequent ink cartridge and desorption is suppressed by having constituted the guide means so that that time might make loose the engagement condition of the ink cartridge which was not with backlash, and predetermined stowage material. With the configuration in which especially the supply pipe supporter is formed in the direct ink jet recording head, a clear printing image is obtained possible [stopping the bad influence to the interior passage of an ink jet recording head, and the inclination of an ink jet recording head face side to the minimum] consequently.

[0056] (3) It is effective in raising operability further by setting up the location which has spring nature in an ink cartridge and where it escapes, and the stop section is prepared, an ink cartridge falls out, and the spring nature of the stop section begins to act, after the ink cartridge fitting section and a supply pipe supporter changed into the fitting condition.

[0057] (4) By preparing notching in the ink cartridge fitting section, and having made it have spring nature, it is possible to also make the load to a supply pipe supporter etc. mitigate further.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the ink cartridge and ink jet recording apparatus which are used for the ink cartridge positioning approach at the time of making an ink jet recording apparatus equip with an ink cartridge, and this approach.

PRIOR ART

[Description of the Prior Art] Conventionally, the thing about the structure of positioning a removable ink cartridge to a position in an ink jet recording apparatus is known for JP,63-15752,A or JP,59-12855,A.

[0003] The mimetic diagram showing the positioning structure of the conventional ink cartridge where drawing 6 was indicated by JP,63-15752,A, and drawing 7 are the mimetic diagrams showing the positioning structure of the conventional ink cartridge indicated by JP,59-12855,A.

[0004] The positioning structure of an ink cartridge shown in drawing 6 makes a plug penetrate a

needle 66, making the plug of an ink cartridge 61, and the needle 66 of a cartridge case 63 position, and it consists of inserting making the locator pin 62 prepared in the ink cartridge 61 meet the location notch 64 prepared in the cartridge case 63 so that ink may be supplied from the ink feed hopper 65 of a cartridge case 63 through the plug of an ink cartridge 61.

[0005] The positioning structure of an ink cartridge shown in drawing 7 is inserting and carrying out fitting of the ink cartridge 71 to the supply pipe 73 for supplying ink to the ink tank 72, and is the structure of positioning an ink cartridge 71 and preventing the ink leakage from an ink cartridge 71.

EFFECT OF THE INVENTION

[Effect of the Invention] Since this invention is constituted as explained above, effectiveness which is indicated below is done so.

[0054] (1) In order to connect an ink jet recording head with an ink cartridge through a supply pipe, in case it equips with the ink cartridge to predetermined stowage material, while guiding an ink cartridge using a guide means, The ink cartridge fitting section prepared near the plug for sealing ink in an ink cartridge By carrying out fitting to the wall surrounding the surroundings of the supply pipe which protruded on the supply pipe supporter which protruded on predetermined stowage material, or the interior of predetermined stowage material, and considering as the structure of performing positioning with the location of a supply pipe, and the location of the prepared hole of a plug or a plug Operability is raised and the location of a supply pipe and the location of the prepared hole of a plug or a plug can be positioned with high precision.

[0055] (2) When it arrives at the location where fitting of the ink cartridge fitting section and the supply pipe supporter begins to be carried out in the process which equips with an ink cartridge and goes, damage on the supply pipe supporter in wearing of a frequent ink cartridge and desorption is suppressed by having constituted the guide means so that that time might make loose the engagement condition of the ink cartridge which was not with backlash, and predetermined stowage material. With the configuration in which especially the supply pipe supporter is formed in the direct ink jet recording head, a clear printing image is obtained possible [stopping the bad influence to the interior passage of an ink jet recording head, and the inclination of an ink jet recording head face side to the minimum] consequently.

[0056] (3) It is effective in raising operability further by setting up the location which has spring nature in an ink cartridge and where it escapes, and the stop section is prepared, an ink cartridge falls out, and the spring nature of the stop section begins to act, after the ink cartridge fitting section and a supply pipe supporter changed into the fitting condition.

[0057] (4) By preparing notching in the ink cartridge fitting section, and having made it have spring nature, it is possible to also make the load to a supply pipe supporter etc. mitigate further.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional example, there are the following troubles in positioning of an ink cartridge.

[0007] The tip of the needle for leading the ink in an ink cartridge in an ink jet head is keenly dangerous with the conventional example shown in JP,63-15752,A. Then, although what is necessary is just to form the prepared hole in the plug beforehand using tubing of the shape of a pipe which is not sharp so that tubing may penetrate the plug of an ink cartridge easily, even if it takes such a cure, if there is a location gap of the prepared hole of a plug and tubing, tubing may penetrate to a plug, and may run away, or may not penetrate at all.

[0008] Moreover, in the conventional example shown in JP,59-12855,A, only the ink supply pipe for supplying ink to an ink tank on the occasion of wearing of an ink cartridge is prepared, but since the part which carries out fitting in the case of wearing of an ink cartridge becomes the so-called hand darkness, it is hard to equip with it. As the cure, the guide section is prepared in the periphery of an ink cartridge etc., and it is possible to guide even the part which finally carries out fitting.

[0009] However, as a result of restraining the fitting section of an ink cartridge even after positioning an ink cartridge and an ink supply pipe by fitting if the above-mentioned guide section is prepared and dimension process tolerance of an ink cartridge is further made high fairly in order to carry out fitting of the ink cartridge certainly to the above-mentioned ink supply pipe when it is made such a configuration, it is not desirable when a load joining the supporter of an ink supply pipe etc. and exchanging ink cartridges frequently is considered. On the other hand, if the clearance between the above-mentioned guide section and an ink cartridge is enlarged and dimension process tolerance is made loose, although the above-mentioned load is not added, it cannot show correctly the part which finally carries out fitting to an ink cartridge, but will stop being able to fit in easily. Furthermore, since the clearance is large when an ink cartridge is leaned by hand etc., an ink cartridge will incline easily, consequently a supply pipe, a supply pipe supporter, etc. will be joined by the load.

[0010] Then, it is in the purpose of this invention offering the ink cartridge positioning approach that show around with a sufficient precision in wearing of an ink cartridge, and positioning in view of the trouble of the above-mentioned conventional technique until fitting of an ink supply pipe and an ink cartridge begins, and a load joins neither a supply pipe nor a supply pipe supporter after fitting termination, this ink cartridge, and an ink jet recording device.

[0011] Other purposes of this invention The predetermined stowage material for containing an ink cartridge up to the location into which the fitting section of an ink cartridge and the supporter of an ink supply pipe begin to fit, and engagement of an ink cartridge so that there may be nothing with backlash While showing around and positioning the location of an ink supply pipe, and the location of an ink cartridge with high precision It is loosening the engagement condition of predetermined stowage material and an ink cartridge after fitting. The ink cartridge positioning approach which can also lessen the burden to a supply pipe supporter, without restraining an ink cartridge with the supporter of an ink supply pipe after predetermined stowage material is completely equipped with an ink cartridge, It is in offering this ink cartridge and an ink jet recording device.

MEANS

[Means for Solving the Problem] The 1st invention for attaining the above-mentioned purpose by fitting with ink supply pipe support of the fitting section of an ink cartridge, and an ink cartridge stowage Until it is the cartridge positioning approach at the time of equipping with said ink cartridge and the fitting section and said ink supply pipe supporter of said ink cartridge begin to fit into said ink cartridge stowage The step which guides said ink cartridge and positions the location of the location of an ink supply pipe, and the fitting section of an ink cartridge by engagement to said ink cartridge stowage and said ink cartridge, After fitting of the fitting section of said ink cartridge, and said ink supply pipe supporter It is characterized by including the step which carries out partial discharge of the engagement to said ink cartridge stowage and said ink cartridge at least, and carries out the completion of wearing of said ink cartridge to said ink cartridge stowage.

[0013] The 2nd invention for attaining the above-mentioned purpose is an ink jet recording device which records on a record medium using an ink jet head. The cartridge stowage for containing the ink cartridge for storing the ink supplied to said ink jet head, and the ink in said ink cartridge in order [said] to carry out ink jet head supply The fitting section which said ink cartridge has to said cartridge stowage, and the ink supply pipe located possible [fitting], The supply pipe supporter located in said cartridge stowage in order to support said ink supply pipe, The cartridge installation side for laying the ink cartridge concerned, when said ink cartridge is contained by said cartridge stowage, The interior material of a proposal prepared in said cartridge stowage in order to engage with said ink cartridge and to show around when showing said ink cartridge to said cartridge installation side, An implication and said interior material of a proposal are characterized by having the interior of the 1st proposal and the 2nd proposal which engages with said ink cartridge in the early stages of guidance and which cancels engagement to said ink cartridge partially at least in the telophase of guidance.

[0014] The 3rd invention for attaining the above-mentioned purpose is contained by the cartridge stowage of the ink jet recording apparatus which records on a record medium using an ink jet head. The supply pipe supporter and cartridge installation side for supporting an ink supply pipe and this ink supply pipe in this cartridge stowage here are carrying out the location location. The fitting section for fitting in with said ink supply pipe, in order to be an ink cartridge for storing the ink supplied to said ink jet head and to supply the ink in said ink cartridge to said ink jet head, The interior material of a proposal for engaging with said cartridge stowage and showing around, in case said ink cartridge is guided to said cartridge installation side is included. Said interior material of a proposal It is characterized by having the interior of the 1st proposal and the 2nd proposal which engages with said ink cartridge in the early stages of guidance and which cancels engagement to said ink cartridge partially at least in the telophase of guidance.

[0015] As opposed to the predetermined stowage material to which the 4th invention for attaining the above-mentioned purpose sealed ink inside with the plug which consists of an elastic member in which the prepared hole was formed The ink cartridge which can be detached and attached freely, The supply pipe arranged on said stowage material in order to supply the ink in this ink cartridge to an ink jet recording head, It is the ink jet recording device equipped with the supply pipe supporter which supports this supply pipe. The guide means for being prepared relatively [ink cartridge / said / predetermined stowage material and said predetermined ink cartridge], and showing said ink cartridge to the interior of said predetermined stowage material,

It is prepared near the plug of said ink cartridge, and fitting is carried out to said supply pipe supporter in the process in which the interior of said predetermined stowage material is equipped with said ink cartridge using said guide means. It is characterized by having the ink cartridge fitting section which performs positioning with the location of said supply pipe, and the location of the prepared hole of said plug.

[0016] In the 4th invention of the above, if the interior is equipped with the ink cartridge using the guide means to predetermined stowage material, fitting of the ink cartridge fitting section prepared near the plug for sealing ink in an ink cartridge will be carried out to the supply pipe supporter which protruded on the ink jet recording head built in predetermined stowage material, and it will perform positioning with the location of a supply pipe, and the location of the prepared hole of a plug.

[0017] In such a wearing process, up to the location into which the ink cartridge fitting section and a supply pipe supporter begin to fit, since it shows a guide means to predetermined stowage material and engagement of an ink cartridge so that there may be nothing with backlash, the location of a supply pipe and the location of the prepared hole of a plug are positioned with high precision. Moreover, since the guide means makes loose the engagement condition of a predetermined member and an ink cartridge from the time of being in a fitting condition, after being completely equipped with an ink cartridge, the load to a supply pipe supporter of an ink cartridge is also lost, without being restrained.

[0018]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0019] (1st operation gestalt) Drawing 1 is a mimetic diagram showing the 1st operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention, and shows the condition at the time of ink cartridge wearing.
 [0020] The ink jet recording apparatus with the positioning structure of the ink cartridge of this gestalt is equipped with the carriage 9 for carrying out serial migration of the predetermined ink cartridge stowage material 9a which laid the ink jet recording head 1 as shown in drawing 1 along a record section. In addition, stowage material 9a may be a member equipped with ink cartridge installation side 9b, and although you may be carriage 9 and one, you may be another member which can be freely detached and attached from carriage 9. By this example, stowage material 9a and carriage 9 explain the configuration of one. Carriage 9 is fitted in the surroundings of the sliding shaft 12 pivotable that the end section can slide on the sliding shaft 12, and the other end is engaging with the guide 13. Moreover, carriage 9 can reciprocate in accordance with the sliding shaft 12 with respect to a part of non-illustrated timing belt by driving a timing belt by the non-illustrated motor. During this reciprocating motion, an ink jet recording apparatus makes ink breathe out from the ink jet recording head 1 to predetermined timing, and forms a printing image. In addition, the ink jet recording head 1 is equipped with the electric thermal-conversion object (what transforms electrical energy into heat energy) or electric machine conversion object (mechanical in electrical energy thing changed into a variation rate) for generating the energy for making ink breathe out from an ink delivery.

[0021] Furthermore cartridge stowage material 9a is what has the removable ink cartridge 4 which can store ink, and the supply pipe 3 for leading the ink in an ink cartridge 4 in the ink jet recording head 1 has protruded perpendicularly with the supply pipe supporter 2. Moreover, after the supply pipe 3 and the supply pipe supporter 2 are attached not only in the gestalt currently directly fixed to cartridge stowage material 9a but in other members 1, for example, ink jet

recording head, and this supply pipe 3 and the supply pipe supporter 2 carry out positioning wearing of this ink jet recording head 1 at cartridge stowage material 9a, they may be a gestalt which contains an ink cartridge 4 to cartridge stowage material 9a. The supply pipe 3 and the supply pipe supporter 2 at least should just be located possible [an ink cartridge 4 and fitting] to cartridge stowage material 9a.

[0022] The quirk-like guided section 5 is formed in the lateral portion of an ink cartridge 4. The guide section 10 which has the taper section 11 of a taper configuration in the ink cartridge installation side 9b side is formed in cartridge stowage material 9a. The guided section 5 of an ink cartridge 4 is set up so that insertion may have become possible and there may be only no flute width by the side of the pars basilaris ossis occipitalis of the ink cartridge 4 guided [5] in the guide section 10 as backlash ***** in the engagement condition of the guided section 5 and the guide section 10. Although the guided section 5 is formed in an ink cartridge 4 and the guide section 10 is formed in carriage 9 in this example The guide means which consists of the guide section which can be inserted in quirk-like the guided section and, and this The guide section which can be inserted in the guided section may be prepared for quirk-like the guided section in cartridge stowage material 9a at the ink cartridge 4 that what is necessary is to just be prepared relatively [a / ink car TORRIJI 4 and / cartridge stowage material 9]. Moreover, high positioning of precision of the direction in which two or more engagement parts of the above-mentioned guided section and the guide section are established is attained more.

[0023] Moreover, the plug 6 which has the elasticity which once formed the prepared hole with the needle etc. beforehand is built into an ink cartridge 4, it has that by which the ink inside the ink cartridge 4 concerned is sealed with the plug 6, and the plug 6 which a hole penetrates easily by forcing the tip of a supply pipe 3, and that by which ink was sealed inside the ink cartridge 4 concerned is used. Near the plug 6, after guiding an ink cartridge 4 along with the guide section 10, the ink cartridge fitting section 7 into which the supply pipe supporter 2 fits is formed.

[0024] The omission stop section 8 which it is caught [section] in the opening 14 for a stop prepared in carriage 9, and makes an ink cartridge 4 hold in carriage 9 is formed in the ink cartridge 4. Two or more ink cartridges 4 (yellow, MAZENDA, cyanogen, black) can carry this example in carriage 9.

[0025] Next, the process in which an ink cartridge 4 and a supply pipe 3 are positioned is explained.

[0026] Drawing 2 is drawing for explaining the wearing process and approach of an ink jet cartridge in the 1st operation gestalt of this invention.

[0027] A user inserts the guided section 5 of an ink cartridge 4 in the guide section 10 of cartridge stowage material 9a, and he pushes an ink cartridge 4 on the cartridge installation side 9b side of cartridge stowage material 9a, making the guide section 10 meet.

[0028] Then, as shown in (a) of drawing 2, a supply pipe 3 will be in the condition of having entered in the space of the ink cartridge fitting section 7. At this time, the plug 6 of an ink cartridge 4 does not reach a supply pipe 3 yet, but the guided section 5 is in the engagement condition which is not the guide section 10 and with backlash.

[0029] When an ink cartridge 4 is further pushed down the drawing (cartridge installation side 9b side) from the condition of (a) of drawing 2, as shown in (b) of drawing 2, it is in the condition to which the tip of the ink cartridge fitting section 7 reached at the tip of the supply pipe supporter 2, namely, fitting of the ink cartridge fitting section 7 and the supply pipe supporter 2 will be started. Since the taper section 11 is formed in the pars-basilaris-ossis-occipitalis side of cartridge stowage material 9a of the guide section 10 at this time, the engagement condition of

the guided section 5 and the guide section 10 tends to begin to become loose. Moreover, although the plug 6 has not reached a supply pipe 3 in this condition in drawing 2 (b), the plug 6 and the supply pipe 3 may contact.

[0030] If an ink cartridge 4 is furthermore pushed below, as shown in (c) of drawing 2, the ink cartridge fitting section 7 and the supply pipe supporter 3 are inserted by fitting, and engagement of the guided section 5 and the guide section 10 is loose completely in this condition.

[0031] Then, by laying an ink cartridge 4 in cartridge installation side 9b of carriage 9 completely, a plug 6 reaches a supply pipe 3, a supply pipe 3 penetrates the prepared hole of a plug 6 or a plug 6, and requires for the opening 14 for a stop the omission stop section 8 shown in drawing 1, and wearing of an ink cartridge 4 ends it.

[0032] As mentioned above, since engagement of the guided section 5 and the guide section 10 begins to become loose, an ink cartridge 4 is not restrained by the guide section 10 from the condition to which the tip of the ink cartridge fitting section 7 of an ink cartridge 4 reached at the tip of the supply pipe supporter 2, i.e., the condition that fitting of the ink cartridge fitting section 7 and the supply pipe supporter 2 is started, after wearing of an ink cartridge 4.

[0033] Therefore, smooth wearing of an ink cartridge 4 is attained, and the load to the supply pipe supporter 2 after equipping with an ink cartridge 4 is lost, the inclination of the bad influence to the internal passage of the supply pipe supporter 2 and the ink jet recording head 1 and the face side of the ink jet recording head 1 can be stopped to the minimum in the configuration with which especially the supply pipe supporter 2 is formed in the direct ink jet recording head, and a clear printing image is obtained.

[0034] Moreover, the ink cartridge 4 and really fabricated omission stop section 8 has spring nature. [before pushing an ink cartridge 4, escaping from it and the stop section's 8 starting the opening 14 for a stop] In order to contact the part near the opening 14 for a stop, the force acts in the direction which forces an ink cartridge 4 on the guide section 10, and there is a possibility of barring fitting insertion with the ink cartridge fitting section 7 and the supply pipe supporter 2, in the moment engagement of the guided section 5 and the guide section 10 becomes loose.

[0035] Therefore, it becomes possible to aim at an improvement of the further exact positioning and operability by setting up the location where it escapes and the spring nature of the stop section 8 begins to act, after the ink cartridge fitting section 7 and the supply pipe supporter 2 changed into the fitting condition.

[0036] (2nd operation gestalt) Drawing 3 is a mimetic diagram showing the 2nd operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[0037] This gestalt is an example of a configuration which supplies the ink in ink car TOJJI 24 to the ink tank 34 of the ink jet recording head 21 which equipped with the ink cartridge 24 the cartridge case 33 which is stowage material, and was carried in carriage 28 through a tube 35, as shown in drawing 3.

[0038] Carriage 28 is fitted in the surroundings of the sliding shaft 31 pivotable like the 1st operation gestalt that the end section can slide on the sliding shaft 31, and the other end is engaging with the guide 32. Moreover, carriage 9 can reciprocate in accordance with the sliding shaft 31 with respect to a part of non-illustrated timing belt by driving a timing belt by the non-illustrated motor. During this reciprocating motion, an ink jet recording apparatus makes ink breathe out from the ink jet recording head 21 to predetermined timing, and forms a printing image.

[0039] The end of the tube 35 connected to the ink tank 34 and the other end of the opposite side are connected to the supply pipe supporter 22 of the supply pipe 23 formed in the inner part of

the cartridge case 33. Moreover, the surroundings of a supply pipe 23 are surrounded with the bigger wall 36 than a supply pipe 3, and it constitutes so that the ink cartridge fitting section 27 and a wall 36 may fit in.

[0040] Moreover, the guide section 29 is formed in drawing ***** at the pair, and the guided section 25 of the shape of a quirk corresponding to each of the guide section 20 is formed in the ink cartridge 24 side at the cartridge case 33.

[0041] In this example, since the supply pipe 23 is covered with the wall 36, the configuration which it has that it is hard to be touched by hand, consequently adhesion or the impossible force of dust etc. does not join is shown.

[0042] Next, with reference to drawing 3, the process and the approach that an ink cartridge 24 and a supply pipe 23 are positioned are explained.

[0043] A user inserts the guided section 25 of an ink cartridge 24 in the guide section 29 of a cartridge case 33, and he pushes an ink cartridge 24 on the back side of a cartridge case 73, making the guide section 29 meet.

[0044] Then, it will be in the condition that the tip of the ink cartridge fitting section 27 reached at the tip of a supply pipe 23 and that are a condition, namely, fitting of the ink cartridge fitting section 7 and a wall 36 is started. Since the taper section 30 is formed in the edge of the guide section 29 by the side of the back of a cartridge case 33 at this time, the engagement condition of the guided section 25 and the guide section 29 tends to begin to become loose. Moreover, in this condition, the plug 26 has not reached a supply pipe 23.

[0045] If an ink cartridge 24 is furthermore pushed on the back, since fitting of the ink cartridge fitting section 27 and the wall 36 is carried out and it will be in the condition that engagement of the guided section 25 and the guide section 29 became loose completely, in this condition, an ink cartridge 24 is not strongly restrained from the guide section 29 in the method part of the back of a cartridge case 33.

[0046] After that, further, by pushing an ink cartridge 24, a plug 26 reaches a supply pipe 23, a supply pipe 23 penetrates the prepared hole of a plug 26 or a plug 26, and wearing of an ink cartridge 4 ends it.

[0047] (3rd operation gestalt) This gestalt is considered as the configuration in which a load does not join the supply pipe in the 2nd operation gestalt further.

[0048] Drawing 4 is the cross-section enlarged drawing of the supply pipe periphery of the 3rd operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention. In this drawing, the same sign is attached about the same configuration member as drawing 3, and that explanation is omitted in explanation of this example about the part which overlaps the 2nd operation gestalt.

[0049] In drawing 4, the projection 18 for giving seal nature is formed in both sides of plug 26a, and the slant face 37 is formed in the prepared hole of plug 26a by the side of the tip of the ink cartridge fitting section 27. since [moreover,] plug 26a gives a gap 39 and is included in the ink cartridge 24 -- the direction of an arrow head -- migration -- it is easy.

[0050] as mentioned above, after plug 26a was included in the ink cartridge 24 -- the direction of an arrow head -- migration, since it is easy In the process in which the ink cartridge fitting section 7 and a wall 36 fit in, and are inserted Plug 26a moves to a supply pipe 23 according to an operation of a slant face 37 and a gap 39, and a supply pipe 23 and the prepared hole of plug 26a are positioned still more correctly, without adding a load, and the fall of operability is not caused.

[0051] (4th operation gestalt) Drawing 5 is drawing showing the ink cartridge fitting section

which is the 4th operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[0052] This gestalt gives spring nature as a piece 40 of fitting in drawing 5 by forming notching 41 in the ink cartridge fitting section shown in the 1st or 2nd operation gestalt. By using this configuration, it becomes possible to mitigate the load to a supply pipe supporter and an ink jet recording head further to the 1st and 2nd examples mentioned above.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a mimetic diagram showing the 1st operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[Drawing 2] It is drawing for explaining the wearing process and approach of an ink jet cartridge in the 1st operation gestalt of this invention.

[Drawing 3] It is a mimetic diagram showing the 2nd operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[Drawing 4] It is the cross-section enlarged drawing of the supply pipe periphery of the 3rd operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[Drawing 5] It is the perspective view showing the ink cartridge fitting section which is the 4th operation gestalt of the ink cartridge positioning structure of the ink jet recording apparatus by this invention.

[Drawing 6] It is the mimetic diagram showing an example of the positioning structure of the conventional ink cartridge.

[Drawing 7] It is the mimetic diagram showing other examples of the positioning structure of the conventional ink cartridge.

[Description of Notations]

1 21 Ink jet recording head

2 22 Supply pipe supporter

3 23 Supply pipe

4 24 Ink cartridge

5 25 The guided section

6 26 Plug

7 27 Ink cartridge fitting section

8 Escape and it is Stop Section.

9 28 Carriage

9a Cartridge stowage material

9b Ink cartridge installation side

10 29 Guide section

11 30 Taper section

12 31 Sliding shaft

13 32 Guide

14 Opening for Stop

15 33 Cartridge case

16 34 Ink tank

17 35 Tube
36 Wall
37 Slant Face
38 Projection
39 Gap
40 Piece of Fitting
41 Notching

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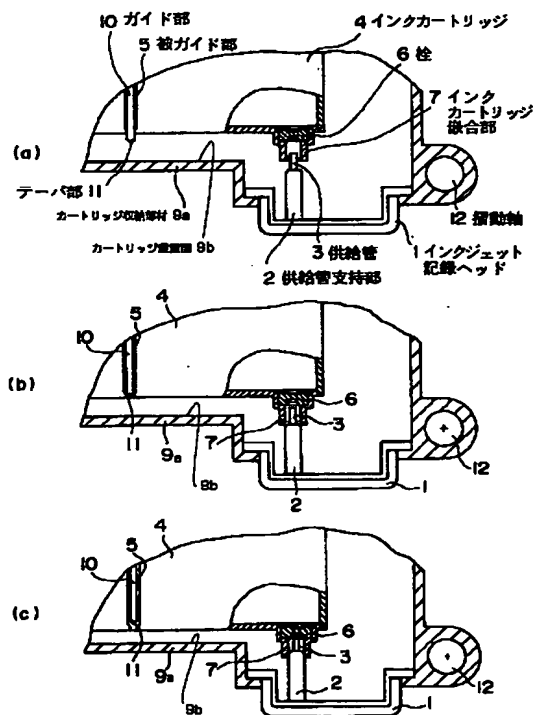
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(54) 【発明の名称】 インクカートリッジ位置決め方法、インクカートリッジ及びインクジェット記録装置

(57) 【要約】

【課題】 インクタンクへのインク供給管とインクカートリッジの栓の下穴との嵌合が開始するまで精度良く案内し、嵌合終了後においては供給管や供給管支持部等に負荷が加わらないようにする。

【解決手段】 インクカートリッジ４のインクカートリッジ嵌合部７の先端が供給管支持部２の先端に到達するまで案内し、インクカートリッジ嵌合部７と供給管支持部２との嵌合が開始される状態から、被ガイド部５とガイド部１０の係合は緩くなり始め、インクカートリッジ４の装着後においてもインクカートリッジ４はガイド部１０によって拘束されないように構成されている。



【特許請求の範囲】

【請求項 1】 インクカートリッジの嵌合部とインクカートリッジ収納部のインク供給管支持との嵌合により、前記インクカートリッジ収納部に前記インクカートリッジを装着する際のカートリッジ位置決め方法であって、前記インクカートリッジの嵌合部と前記インク供給管支持部とが嵌合し始めるまで、前記インクカートリッジ収納部と前記インクカートリッジとの係合によって前記インクカートリッジを案内してインク供給管の位置とインクカートリッジの嵌合部との位置とを位置決めするステップと、

前記インクカートリッジの嵌合部と前記インク供給管支持部との嵌合後に、前記インクカートリッジ収納部と前記インクカートリッジとの係合を少なくとも部分解除して前記インクカートリッジを前記インクカートリッジ収納部へ装着完了するステップと、を含むことを特徴とするインクカートリッジ位置決め方法。

【請求項 2】 前記位置決めステップは、前記インクカートリッジ収納部と前記インクカートリッジとの係合をガタつきのないようにして前記インクカートリッジを案内して前記インク供給管の位置と前記インクカートリッジの嵌合部の位置とを高精度に位置決めする、請求項 1 に記載のインクカートリッジ位置決め方法。

【請求項 3】 前記装着完了ステップは、前記インクカートリッジ収納部と前記インクカートリッジとの係合状態を緩めて前記インクカートリッジを案内して前記インクカートリッジを前記インク供給管支持部に拘束されないで前記インクカートリッジ収納部に装着完了する、請求項 1 に記載のインクカートリッジ位置決め方法。

【請求項 4】 前記インクカートリッジ収納部は、インクを吐出するインクジェットヘッドを用いて記録媒体に記録を行うインクジェット記録装置に具備されている、請求項 1 に記載のインクカートリッジ位置決め方法。

【請求項 5】 前記インクカートリッジ収納部は、記録領域をシリアル移動するキャリッジに配されている、請求項 4 に記載のインクカートリッジ位置決め方法。

【請求項 6】 前記インクジェットヘッドは、インクを吐出するためのエネルギー発生させるための電気熱変換体を備えている、請求項 4 に記載のインクカートリッジ位置決め方法。

【請求項 7】 インクジェットヘッドを用いて記録媒体に記録を行うインクジェット記録装置であって、前記インクジェットヘッドへ供給するインクを貯蔵するためのインクカートリッジを収納するためのカートリッジ収納部と、

前記インクカートリッジ内のインクを前記インクジェットヘッドへ供給するために、前記カートリッジ収納部に対して前記インクカートリッジの有する嵌合部と嵌合可能に位置するインク供給管と、

前記インク供給管を支持するために前記カートリッジ収

納部に位置する供給管支持部と、

前記インクカートリッジが前記カートリッジ収納部に収納された際に当該インクカートリッジを載置するためのカートリッジ載置面と、

前記インクカートリッジを前記カートリッジ載置面へ案内する際に、前記インクカートリッジと係合して案内するために前記カートリッジ収納部に設けられた案内部材と、を含む、

前記案内部材は、案内初期において前記インクカートリッジと係合する第 1 案内部と、案内終期において前記インクカートリッジとの係合を少なくとも部分的に解除する第 2 案内部と、を備えることを特徴とするインクジェット記録装置。

【請求項 8】 前記第 1 案内部は、前記インクカートリッジ収納部と前記インクカートリッジとの係合をガタつきのないようにして前記インクカートリッジを案内して前記インク供給管の位置と前記インクカートリッジの嵌合部の位置とを高精度に位置決めする、請求項 7 に記載のインクジェット記録装置。

【請求項 9】 前記第 2 案内部は、前記インクカートリッジ収納部と前記インクカートリッジとの係合状態を緩めて前記インクカートリッジを案内して前記インクカートリッジを前記供給管支持部に拘束されない状態で前記インクカートリッジ収納部に装着する、請求項 8 に記載のインクジェット記録装置。

【請求項 10】 前記第 2 案内部は、前記インクカートリッジへの係合状態を緩めるためのテーパー形状を有する、請求項 9 に記載のインクジェット記録装置。

【請求項 11】 前記インクカートリッジ収納部は、記録領域をシリアル移動するキャリッジに配されている、請求項 8 に記載のインクジェット記録装置。

【請求項 12】 前記インクジェットヘッドは、インクを吐出するためのエネルギーを発生させるための電気熱変換体を備えている、請求項 8 に記載のインクジェット記録装置。

【請求項 13】 インクジェットヘッドを用いて記録媒体に記録を行うインクジェット記録装置のカートリッジ収納部に収納され、ここで該カートリッジ収納部にはインク供給管と該インク供給管を支持するための供給管支持部とカートリッジ載置面とが位置している、前記インクジェットヘッドに供給されるインクを貯蔵するためのインクカートリッジであって、前記インクカートリッジ内のインクを前記インクジェットヘッドへ供給するために前記インク供給管と嵌合するための嵌合部と、

前記インクカートリッジが前記カートリッジ載置面へ案内される際に、前記カートリッジ収納部と係合して案内するための案内部材と、を含む、

前記案内部材は、案内初期において前記インクカートリッジと係合する第 1 案内部と、案内終期において前記イ

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ンクカートリッジとの係合を少なくとも部分的に解除する第2案内部と、を備えることを特徴とするインクカートリッジ。

【請求項14】 前記第1案内部は、前記インクカートリッジ収納部と前記インクカートリッジとの係合をガタつきのないようにして前記インクカートリッジを案内して前記インク供給管の位置と前記インクカートリッジの嵌合部の位置とを高精度に位置決めする、請求項13に記載のインクカートリッジ。

【請求項15】 前記第2案内部は、前記インクカートリッジ収納部と前記インクカートリッジとの係合状態を緩めて前記インクカートリッジを案内して前記インクカートリッジを前記供給管支持部に拘束されない状態で前記インクカートリッジ収納部に装着する、請求項13に記載のインクカートリッジ。

【請求項16】 前記第2案内部は、前記インクカートリッジ収納部への係合状態を緩めるためのテーパ形状を有する、請求項13に記載のインクカートリッジ。

【請求項17】 前記インクカートリッジ収納部は、記録領域をシリアル移動するキャリッジに配されている、請求項13に記載のインクカートリッジ。

【請求項18】 前記インクジェットヘッドは、インクを吐出するためのエネルギーを発生させるための電気熱変換体を備えている、請求項13に記載のインクカートリッジ。

【請求項19】 下穴が形成された弾性部材からなる栓で内部にインクを密封した、所定の収納部材に対して着脱自在なインクカートリッジと、該インクカートリッジ内のインクをインクジェット記録ヘッドに供給するために前記収納部材に配された供給管と、該供給管を支持する供給管支持部と、を備えたインクジェット記録装置であって、

前記所定の収納部材および前記インクカートリッジに相対的に設けられ、前記インクカートリッジを前記所定の収納部材の内部へ案内するためのガイド手段と、

前記インクカートリッジの栓の近傍に設けられ、前記ガイド手段を用いて前記インクカートリッジが前記所定の収納部材の内部へ装着されていく過程で前記供給管支持部と嵌合されて、前記供給管の位置と前記栓の下穴の位置との位置決めを行うインクカートリッジ嵌合部と、を有することを特徴とするインクジェット記録装置。

【請求項20】 前記ガイド手段は、前記インクカートリッジを前記所定の収納部材に装着していく過程において、前記インクカートリッジ嵌合部の先端が前記供給管支持部の先端に到達した時、その時までガタつきの無かった前記所定の収納部材と前記インクカートリッジとの係合状態を緩くするように構成されている、請求項19に記載のインクジェット記録装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、インクカートリッジをインクジェット記録装置に装着させる際のインクカートリッジ位置決め方法、該方法に用いられるインクカートリッジ及びインクジェット記録装置に関する。

【0002】

【従来の技術】従来、インクジェット記録装置において着脱可能なインクカートリッジを所定の位置に位置決めする構造に関するものが、特開昭63-15752号公報や特開昭59-12855号公報にて知られている。

【0003】図6は特開昭63-15752号公報に開示された従来のインクカートリッジの位置決め構造を示す模式図、図7は特開昭59-12855号公報に開示された従来のインクカートリッジの位置決め構造を示す模式図である。

【0004】図6に示すインクカートリッジの位置決め構造は、インクカートリッジ61に設けた位置決めピン62をカートリッジケース63に設けた位置決め溝64に沿わせながら挿入することで、インクカートリッジ61の栓とカートリッジケース63の針66を位置決めさせつつ針66を栓に貫通させ、インクカートリッジ61の栓を通じてインクをカートリッジケース63のインク供給口65から供給するように構成されている。

【0005】図7に示すインクカートリッジの位置決め構造は、インクカートリッジ71をインクタンク72へインクを供給するための供給管73に差し込み、嵌合させることで、インクカートリッジ71の位置決めを行い、かつインクカートリッジ71からのインク漏れを防止する構造となっている。

【0006】

【発明が解決しようとする課題】しかしながら、上述の従来例ではインクカートリッジの位置決めにおいて以下のような問題点がある。

【0007】特開昭63-15752号公報に示されている従来例では、インクカートリッジ内のインクをインクジェットヘッド内に導くための針の先端が鋭く危険である。そこで針の先端が鋭利ではないパイプ状の管を用い、管がインクカートリッジの栓を容易に貫通するように、栓には予め下穴を形成しておけばよいが、このような対策を講じて、栓の下穴と管の位置ずれがあると、管が栓に貫通しずらかったり、あるいは全く貫通しない場合がある。

【0008】また、特開昭59-12855号公報に示されている従来例では、インクカートリッジの装着に際してインクタンクへインクを供給するためのインク供給管のみしか用意されておらず、インクカートリッジの装着の際に嵌合させる部分はいわゆる手暗がりになる為、装着しにくい。その対策としては、インクカートリッジの外周等にガイド部を設け、最終的に嵌合させる部分までを案内することが考えられる。

【0009】しかし、このような構成にした場合、前述

のインク供給管に対してインクカートリッジを確実に嵌合させるため前述のガイド部を設け、更にインクカートリッジの寸法加工精度を相当に高くすると、インクカートリッジとインク供給管とを嵌合により位置決めを行った後もインクカートリッジの嵌合部が拘束されてしまう結果、インク供給管の支持部等に負荷が加わり、インクカートリッジを頻繁に交換することを考えた場合好ましくない。一方、前述のガイド部とインクカートリッジとの隙間を大きくするなどして寸法加工精度を緩くすると上記の負荷は加わらないが、最終的に嵌合させる部分にインクカートリッジを正確に案内できず嵌合しにくくなってしまふ。さらに、手などでインクカートリッジが傾けられた場合には、隙間が大きいので、インクカートリッジが容易に傾き、その結果、供給管や供給管支持部などに負荷が加わることになる。

【0010】そこで本発明の目的は上記従来技術の問題点に鑑み、インクカートリッジの装着、位置決めにおいて、インク供給管とインクカートリッジとの嵌合が開始するまで精度良く案内し、嵌合終了後においては供給管や供給管支持部等に負荷が加わらない、インクカートリッジ位置決め方法、該インクカートリッジ及びインクジェット記録装置を提供することにある。

【0011】本発明の他の目的は、インクカートリッジの嵌合部とインク供給管の支持部とが嵌合し始める位置まではインクカートリッジを収納するための所定の収納部材とインクカートリッジの係合をガタつきのないように案内してインク供給管の位置とインクカートリッジの位置とを高精度に位置決めすると共に、嵌合後においては所定の収納部材とインクカートリッジの係合状態を緩めることで、インクカートリッジが所定の収納部材に完全に装着された後はインクカートリッジをインク供給管の支持部に拘束することなく供給管支持部への負担も少なくできるインクカートリッジ位置決め方法、該インクカートリッジ及びインクジェット記録装置を提供することにある。

【0012】

【課題を解決するための手段】上記目的を達成するための第1の発明は、インクカートリッジの嵌合部とインクカートリッジ収納部のインク供給管支持との嵌合により、前記インクカートリッジ収納部に前記インクカートリッジを装着する際のカートリッジ位置決め方法であって、前記インクカートリッジの嵌合部と前記インク供給管支持部とが嵌合し始めるまで、前記インクカートリッジ収納部と前記インクカートリッジとの係合によって前記インクカートリッジを案内してインク供給管の位置とインクカートリッジの嵌合部との位置とを位置決めするステップと、前記インクカートリッジの嵌合部と前記インク供給管支持部との嵌合後に、前記インクカートリッジ収納部と前記インクカートリッジとの係合を少なくとも部分解除して前記インクカートリッジを前記インクカ

ートリッジ収納部へ装着完了するステップと、を含むことを特徴とする。

【0013】上記目的を達成するための第2発明は、インクジェットヘッドを用いて記録媒体に記録を行うインクジェット記録装置であって、前記インクジェットヘッドへ供給するインクを貯蔵するためのインクカートリッジを収納するためのカートリッジ収納部と、前記インクカートリッジ内のインクを前記インクジェットヘッドへ供給するために、前記カートリッジ収納部に対して前記インクカートリッジの有する嵌合部と嵌合可能に位置するインク供給管と、前記インク供給管を支持するために前記カートリッジ収納部に位置する供給管支持部と、前記インクカートリッジが前記カートリッジ収納部に収納された際に当該インクカートリッジを載置するためのカートリッジ載置面と、前記インクカートリッジを前記カートリッジ載置面へ案内する際に、前記インクカートリッジと係合して案内するために前記カートリッジ収納部に設けられた案内部材と、を含み、前記案内部材は、案内初期において前記インクカートリッジと係合する第1案内部と、案内終期において前記インクカートリッジとの係合を少なくとも部分的に解除する第2案内部と、を備えることを特徴とする。

【0014】上記目的を達成するための第3発明は、インクジェットヘッドを用いて記録媒体に記録を行うインクジェット記録装置のカートリッジ収納部に収納され、ここで該カートリッジ収納部にはインク供給管と該インク供給管を支持するための供給管支持部とカートリッジ載置面とが位置位置している、前記インクジェットヘッドに供給されるインクを貯蔵するためのインクカートリッジであって、前記インクカートリッジ内のインクを前記インクジェットヘッドへ供給するために前記インク供給管と嵌合するための嵌合部と、前記インクカートリッジが前記カートリッジ載置面へ案内される際に、前記カートリッジ収納部と係合して案内するための案内部材と、を含み、前記案内部材は、案内初期において前記インクカートリッジと係合する第1案内部と、案内終期において前記インクカートリッジとの係合を少なくとも部分的に解除する第2案内部と、を備えることを特徴とする。

【0015】上記目的を達成するための第4発明は、下穴が形成された弾性部材からなる栓で内部にインクを密封した、所定の収納部材に対して着脱自在なインクカートリッジと、該インクカートリッジ内のインクをインクジェット記録ヘッドに供給するために前記収納部材に配された供給管と、該供給管を支持する供給管支持部と、を備えたインクジェット記録装置であって、前記所定の収納部材および前記インクカートリッジに相対的に設けられ、前記インクカートリッジを前記所定の収納部材の内部へ案内するためのガイド手段と、前記インクカートリッジの栓の近傍に設けられ、前記ガイド手段を用いて

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前記インクカートリッジが前記所定の収納部材の内部へ装着されていく過程で前記供給管支持部と嵌合されて、前記供給管の位置と前記栓の下穴の位置との位置決めを行うインクカートリッジ嵌合部と、を有することを特徴とする。

【0016】上記第4発明では、所定の収納部材に対してインクカートリッジを内部へとガイド手段を用いて装着していくと、インクカートリッジにおける、インクを密封するための栓の近傍に設けられたインクカートリッジ嵌合部は、所定の収納部材に内蔵されたインクジェット記録ヘッドに突設された供給管支持部と嵌合されて、供給管の位置と栓の下穴の位置との位置決めを行う。

【0017】このような装着過程において、インクカートリッジ嵌合部と供給管支持部とが嵌合し始める位置までは、ガイド手段は所定の収納部材とインクカートリッジの係合をガタつきの無いように案内するので、供給管の位置と栓の下穴の位置とは高精度に位置決めされる。また、嵌合状態になった時点からガイド手段は所定の部材とインクカートリッジの係合状態を緩くしているので、インクカートリッジが完全に装着された後は、インクカートリッジは拘束されることなく、供給管支持部への負荷も無くなる。

【0018】

【発明の実施の形態】以下、本発明の実施の形態について図面を参照して説明する。

【0019】(第1の実施形態)図1は、本発明によるインクジェット記録装置のインクカートリッジ位置決め構造の第1の実施形態を表す模式図であり、インクカートリッジ装着時の状態を示す。

【0020】本形態のインクカートリッジの位置決め構造を持つインクジェット記録装置は、図1に示すようにインクジェット記録ヘッド1を載置した所定のインクカートリッジ収納部材9aを記録領域に沿ってシリアル移動させるためのキャリッジ9を備えている。尚、収納部材9aはインクカートリッジ載置面9bを備える部材であって、キャリッジ9と一体であっても良いが、キャリッジ9から着脱自在の別部材であっても良い。本例では収納部材9aとキャリッジ9とが一体の構成について説明する。キャリッジ9は、一端部が摺動軸12に摺動可能で、かつ摺動軸12の回りに回転可能に嵌挿され、他端部がガイド13と係合されている。またキャリッジ9は、不図示のタイミングベルトの一部と係わり、不図示のモーターによりタイミングベルトを駆動することにより摺動軸12に沿って往復運動可能となっている。この往復運動中、インクジェット記録装置はインクジェット記録ヘッド1から所定のタイミングにてインクを吐出させて印字画像を形成する。尚、インクジェット記録ヘッド1はインク吐出口からインクを吐出させるためのエネルギーを発生させるための電気熱変換体(電気エネルギーを熱エネルギーに変換するもの)若しくは電気機械変

換体(電気エネルギーを機械的変位に変換するもの)を備えている。

【0021】さらにカートリッジ収納部材9aは、インクを貯蔵可能なインクカートリッジ4が着脱可能なものとなっており、インクカートリッジ4内のインクをインクジェット記録ヘッド1内に導くための供給管3が供給管支持部2にて垂直に突設してある。また、この供給管3及び供給管支持部2は、カートリッジ収納部材9aに直接固定されている形態だけでなく、他の部材、例えば、インクジェット記録ヘッド1に供給管3及び供給管支持部2が取り付けられていて、このインクジェット記録ヘッド1をカートリッジ収納部材9aに位置決め装着した後にインクカートリッジ4をカートリッジ収納部材9aに収納する形態であっても良い。少なくとも供給管3及び供給管支持部2はカートリッジ収納部材9aに対してインクカートリッジ4と嵌合可能に位置していれば良い。

【0022】インクカートリッジ4の側面部には、溝形状の被ガイド部5が形成されている。カートリッジ収納部材9aには、インクカートリッジ載置面9b側にてテーパ形状のテーパ部11を持つガイド部10が設けられている。インクカートリッジ4の被ガイド部5は、ガイド部10に挿入可能となっており、被ガイド5のインクカートリッジ4の底部側の溝幅のみが、被ガイド部5とガイド部10の係合状態においてガタつくことのないように設定されている。本例では、被ガイド部5をインクカートリッジ4に、ガイド部10をキャリッジ9に設けているが、溝形状の被ガイド部およびこれに挿入可能なガイド部からなるガイド手段は、インクカートリッジ4およびカートリッジ収納部材9aに相対的に設けられていればよく、すなわち、溝形状の被ガイド部をカートリッジ収納部材9aに、その被ガイド部に挿入可能なガイド部をインクカートリッジ4に設けていてもよい。また、前述の被ガイド部とガイド部との係合箇所は複数設けられている方がより精度の高い位置決めが可能となる。

【0023】また、インクカートリッジ4には、予め針などで一旦下穴を形成した弾性特性を有する栓6が組み込まれ、栓6により当該インクカートリッジ4の内部のインクが密封されているものや、供給管3の先端を押し付けることで容易に穴が貫通する栓6を備え、当該インクカートリッジ4の内部にインクが密封されたものが用いられる。栓6の近傍には、ガイド部10に沿ってインクカートリッジ4を案内した後に供給管支持部2が嵌合するインクカートリッジ嵌合部7が設けられている。

【0024】インクカートリッジ4には、キャリッジ9に設けられた係止用開口14に引っ掛かりインクカートリッジ4をキャリッジ9内に保持させる抜け止め部8が設けられている。本例は、複数のインクカートリッジ4(イエロー、マゼンダ、シアン、ブラック)がキャリッ

ジ 9 に搭載可能となっている。

【0025】次に、インクカートリッジ 4 と供給管 3 とが位置決めされる過程について説明する。

【0026】図 2 は、本発明の第 1 の実施形態におけるインクジェットカートリッジの装着過程及び方法を説明するための図である。

【0027】ユーザーはインクカートリッジ 4 の被ガイド部 5 をカートリッジ収納部材 9 a のガイド部 10 に挿入し、ガイド部 10 に沿わせながらインクカートリッジ 4 をカートリッジ収納部材 9 a のカートリッジ載置面 9 b 側へ押し入れる。

【0028】すると図 2 の (a) に示すように、供給管 3 がインクカートリッジ嵌合部 7 の空間内に入った状態となる。このとき、インクカートリッジ 4 の栓 6 は、まだ供給管 3 に到達しておらず、被ガイド部 5 はガイド部 10 とガタつきの無いような係合状態である。

【0029】図 2 の (a) の状態からさらにインクカートリッジ 4 を図の下方 (カートリッジ載置面 9 b 側) へと押し入れると、図 2 の (b) に示すように、インクカートリッジ嵌合部 7 の先端が供給管支持部 2 の先端に到達した状態で、すなわち、インクカートリッジ嵌合部 7 と供給管支持部 2 との嵌合が開始されることとなる。この時、ガイド部 10 のカートリッジ収納部材 9 a の底部側にはテーパ部 11 が設けられているため、被ガイド部 5 とガイド部 10 の係合状態が緩くなり始めようとする。また、図 2 (b) ではこの状態においても、栓 6 は供給管 3 には到達していないが、栓 6 と供給管 3 とが当接していても良い。

【0030】さらにインクカートリッジ 4 を下方へと押し入れると、図 2 の (c) に示すように、インクカートリッジ嵌合部 7 と供給管支持部 3 とが嵌合により挿入され、この状態では、被ガイド部 5 とガイド部 10 の係合が完全に緩くなっている。

【0031】その後、インクカートリッジ 4 を完全にキャリッジ 9 のカートリッジ載置面 9 b に載置することで、栓 6 は供給管 3 に到達し、供給管 3 は栓 6、若しくは栓 6 の下穴を貫通し、図 1 に示した抜け止め部 8 が係止用開口 14 に掛かり、インクカートリッジ 4 の装着が終了する。

【0032】上述したように、インクカートリッジ 4 のインクカートリッジ嵌合部 7 の先端が供給管支持部 2 の先端に到達した状態、すなわちインクカートリッジ嵌合部 7 と供給管支持部 2 との嵌合が開始される状態から、被ガイド部 5 とガイド部 10 の係合は緩くなり始めるため、インクカートリッジ 4 の装着後においてもインクカートリッジ 4 はガイド部 10 によって拘束されない。

【0033】従って、インクカートリッジ 4 のスムーズな装着が可能となり、また、インクカートリッジ 4 を装着後の供給管支持部 2 への負荷は無くなり、特に供給管支持部 2 が直接インクジェット記録ヘッドに設けられて

いる構成においては供給管支持部 2、インクジェット記録ヘッド 1 の内部流路への悪影響、インクジェット記録ヘッド 1 のフェイス面の傾きを最小限に抑えられ、鮮明な印字画像が得られる。

【0034】また、インクカートリッジ 4 と一体成形した抜け止め部 8 はばね性を有しており、インクカートリッジ 4 を押し入れていき、抜け止め部 8 が係止用開口 14 に掛かる以前においては、係止用開口 14 の近傍の部位と当接するため、インクカートリッジ 4 をガイド部 10 に押し付ける方向に力が作用し、被ガイド部 5 とガイド部 10 の係合が緩くなる瞬間において、インクカートリッジ嵌合部 7 と供給管支持部 2 との嵌合挿入を妨げる虞れがある。

【0035】したがって、抜け止め部 8 のばね性が作用し始める位置を、インクカートリッジ嵌合部 7 と供給管支持部 2 とが嵌合状態になった以降に設定することで、更なる正確な位置決めと操作性の改善を図ることが可能となる。

【0036】(第 2 の実施形態) 図 3 は、本発明によるインクジェット記録装置のインクカートリッジ位置決め構造の第 2 の実施形態を表す模式図である。

【0037】本形態は、図 3 に示すように、インクカートリッジ 24 を収納部材であるカートリッジケース 33 に装着し、キャリッジ 28 に搭載したインクジェット記録ヘッド 21 のインクタンク 34 にインクカートリッジ 24 内のインクをチューブ 35 を通じて供給する構成例である。

【0038】キャリッジ 28 は、第 1 の実施形態と同様、一端部が摺動軸 31 に摺動可能で、かつ摺動軸 31 の回りに回転可能に嵌挿され、他端部がガイド 32 と係合されている。またキャリッジ 9 は、不図示のタイミングベルトの一部と係わり、不図示のモーターによりタイミングベルトを駆動することにより摺動軸 31 に沿って往復運動可能となっている。この往復運動中、インクジェット記録装置はインクジェット記録ヘッド 21 から所定のタイミングにてインクを吐出させて印字画像を形成する。

【0039】インクタンク 34 に接続されたチューブ 35 の一端と反対側の他端は、カートリッジケース 33 の奥に設けた供給管 23 の供給管支持部 22 に接続されている。また、供給管 23 の周りが供給管 3 よりも大きな壁 36 で囲まれており、インクカートリッジ嵌合部 27 と壁 36 とが嵌合するように構成してある。

【0040】また、カートリッジケース 33 には、ガイド部 29 が図面視上下に一对に設けられており、インクカートリッジ 24 側にはガイド部 20 の各々に対応する溝形状の被ガイド部 25 が設けられている。

【0041】本例においては、供給管 23 は壁 36 で覆われているので、手で触れられにくくなっており、その結果、ゴミ等の付着あるいは無理な力が加わることが無

い構成を示している。

【0042】次に、図3を参照し、インクカートリッジ24と供給管23とが位置決めされる過程及び方法について説明する。

【0043】ユーザーはインクカートリッジ24の被ガイド部25をカートリッジケース33のガイド部29に挿入し、ガイド部29に沿わせながらインクカートリッジ24をカートリッジケース73の奥側へ押し入れる。

【0044】すると、インクカートリッジ嵌合部27の先端が供給管23の先端に到達した状態で、すなわち、インクカートリッジ嵌合部7と壁36との嵌合が開始される状態となる。この時、カートリッジケース33の奥側のガイド部29の端部にはテーパ部30が設けられているため、被ガイド部25とガイド部29の係合状態が緩くなり始めようとする。また、この状態においても、栓26は供給管23には到達していない。

【0045】さらにインクカートリッジ24を奥へ押し入れると、インクカートリッジ嵌合部27と壁36とが嵌合され、この状態では、被ガイド部25とガイド部29の係合が完全に緩くなった状態となるので、インクカートリッジ24はカートリッジケース33の奥方部分でガイド部29から強く拘束されることはない。

【0046】その後さらに、インクカートリッジ24を押し入れることで、栓26は供給管23に到達し、供給管23は栓26、若しくは栓26の下穴を貫通し、インクカートリッジ4の装着が終了する。

【0047】(第3の実施形態)本形態は、第2の実施形態における供給管に、さらに負荷が加わらない構成としたものである。

【0048】図4は、本発明によるインクジェット記録装置のインクカートリッジ位置決め構造の第3の実施形態の供給管周辺部の断面拡大図である。この図では、図3と同一の構成部材について同一符号を付してあり、本例の説明において、第2の実施形態と重複する部分についてその説明を省略する。

【0049】図4において、栓26aの両面にはシール性を持たせるための突起18が形成され、インクカートリッジ嵌合部27の先端側における栓26aの下穴には斜面37が形成されている。また栓26aは、間隙39を持たせてインクカートリッジ24に組み込まれているため、矢印方向に移動容易になっている。

【0050】上述したように、栓26aはインクカートリッジ24に組み込まれた後も、矢印方向に移動容易であるため、インクカートリッジ嵌合部7と壁36とが嵌合し挿入される過程において、斜面37および間隙39の作用により栓26aが供給管23に対して移動し、供給管23と栓26aの下穴とが負荷が加わらずにさらに正確に位置決めされ、また、操作性の低下を招くこともない。

【0051】(第4の実施形態)図5は、本発明による

インクジェット記録装置のインクカートリッジ位置決め構造の第4の実施形態であるインクカートリッジ嵌合部を示す図である。

【0052】本形態は、図5において、第1または第2の実施形態に示したインクカートリッジ嵌合部に切り欠き41を形成することにより嵌合片40として、ばね性を持たせたものである。この構成を用いることにより、上述した第1および第2の実施例に対して、さらに供給管支持部およびインクジェット記録ヘッドへの負荷を軽減することが可能となる。

【0053】

【発明の効果】本発明は以上説明したように構成されているので、以下に記載するような効果を奏する。

【0054】(1)インクカートリッジとインクジェット記録ヘッドを供給管を介して接続するために所定の収納部材に対してインクカートリッジを装着していく際、ガイド手段を用いてインクカートリッジを案内すると共に、インクカートリッジにおける、インクを密封するための栓の近傍に設けられたインクカートリッジ嵌合部を、所定の収納部材に突設された供給管支持部、あるいは所定の収納部材の内部に突設された供給管の周りを囲む壁と嵌合させて、供給管の位置と、栓若しくは栓の下穴の位置との位置決めを行う構造とすることにより、操作性を向上させ、供給管の位置と、栓若しくは栓の下穴の位置とを高精度に位置決めできる。

【0055】(2)インクカートリッジを装着して行く過程においてインクカートリッジ嵌合部と供給管支持部が嵌合され始める位置に到達した時、その時までガタつきの無かったインクカートリッジと所定の収納部材との係合状態を緩くするようにガイド手段を構成したことにより、頻繁なインクカートリッジの装着、脱着における供給管支持部の損傷が抑えられる。特に供給管支持部が直接インクジェット記録ヘッドに設けられている構成では、インクジェット記録ヘッド内部流路への悪影響やインクジェット記録ヘッドフェイス面の傾きを最小限に抑えることが可能であり、その結果、鮮明な印字画像が得られる。

【0056】(3)インクカートリッジにばね性を有する抜け止め部を設け、インクカートリッジの抜け止め部のばね性が作用し始める位置を、インクカートリッジ嵌合部と供給管支持部とが嵌合状態になった以降に設定することにより、さらに操作性を向上させる効果がある。

【0057】(4)インクカートリッジ嵌合部に切り欠きを設けてばね性を有するようにしたことにより、さらに供給管支持部等への負荷を軽減させることも可能である。

【図面の簡単な説明】

【図1】本発明によるインクジェット記録装置のインクカートリッジ位置決め構造の第1の実施形態を表す模式図である。

【図2】本発明の第1の実施形態におけるインクジェットカートリッジの装着過程及び方法を説明するための図である。

【図3】本発明によるインクジェット記録装置のインクカートリッジ位置決め構造の第2の実施形態を表す模式図である。

【図4】本発明によるインクジェット記録装置のインクカートリッジ位置決め構造の第3の実施形態の供給管周辺部の断面拡大図である。

【図5】本発明によるインクジェット記録装置のインクカートリッジ位置決め構造の第4の実施形態であるインクカートリッジ嵌合部を示す斜視図である。

【図6】従来のインクカートリッジの位置決め構造の一例を示す模式図である。

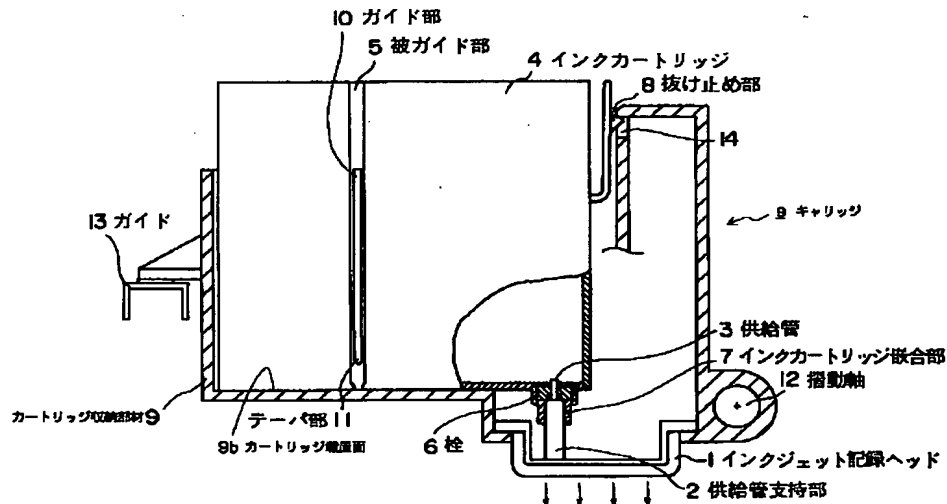
【図7】従来のインクカートリッジの位置決め構造の他の例を示す模式図である。

【符号の説明】

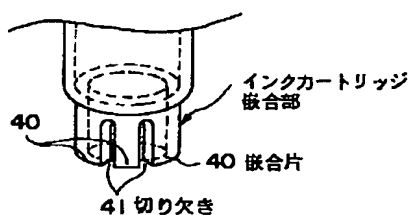
- 1、21 インクジェット記録ヘッド
- 2、22 供給管支持部
- 3、23 供給管
- 4、24 インクカートリッジ

- 5、25 被ガイド部
- 6、26 栓
- 7、27 インクカートリッジ嵌合部
- 8 抜け止め部
- 9、28 キャリッジ
- 9a カートリッジ収納部材
- 9b インクカートリッジ載置面
- 10、29 ガイド部
- 11、30 テーパ部
- 12、31 摺動軸
- 13、32 ガイド
- 14 係止用開口
- 15、33 カートリッジケース
- 16、34 インクタンク
- 17、35 チューブ
- 36 壁
- 37 斜面
- 38 突起
- 39 間隙
- 20 40 嵌合片
- 41 切り欠き

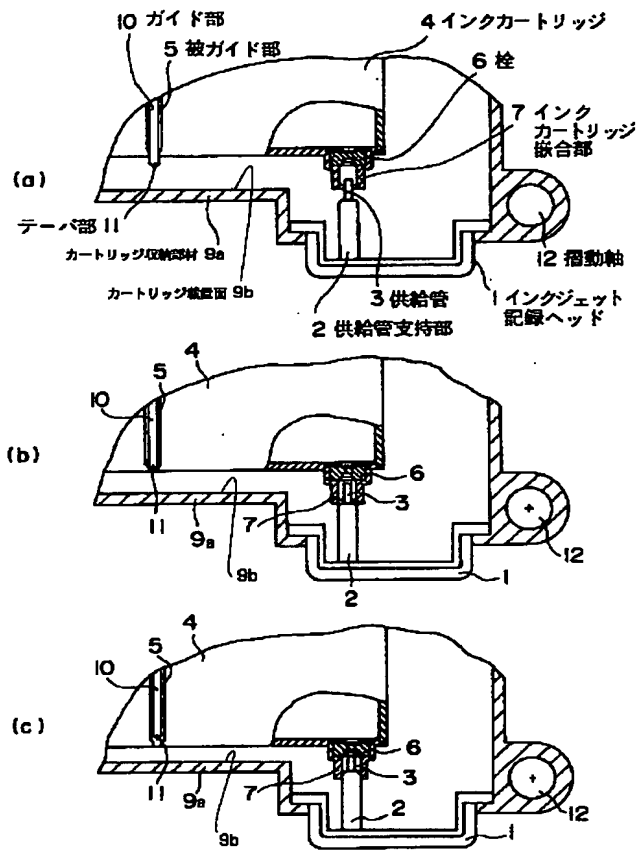
【図1】



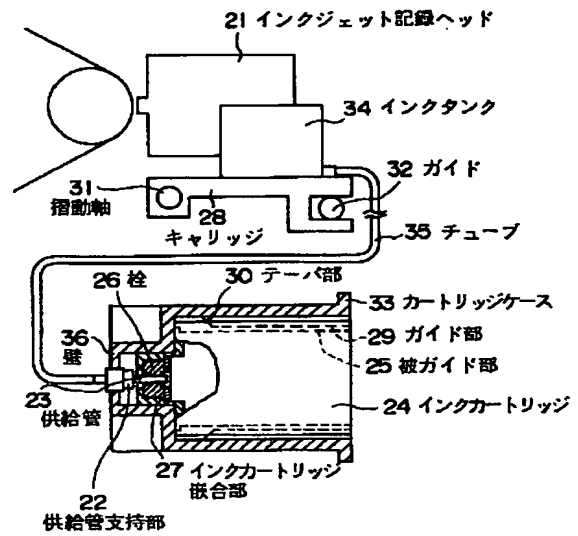
【図5】



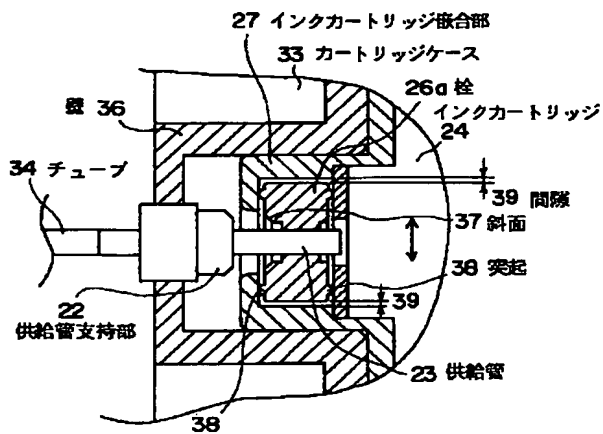
【図2】



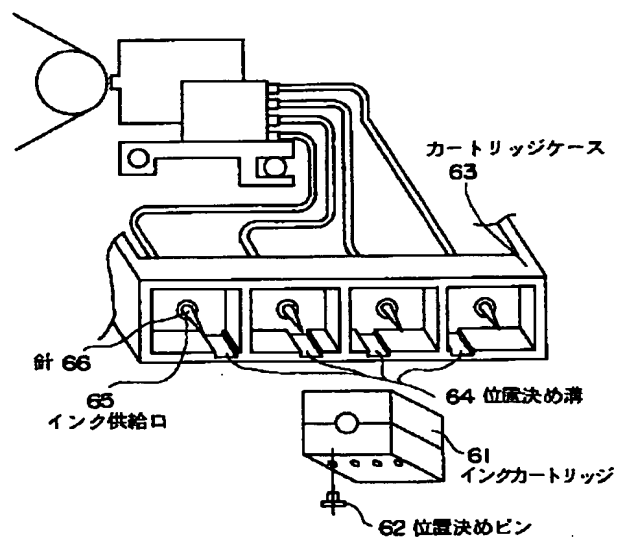
【図3】



【図4】



【図6】



【図 7】

